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Box PATENT APPLICATION
Assistant Commissioner
for Patents
Washington, D. C. 20231

Docket No.: 3597-16

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NUMBER EL258956254US
DATE OF DEPOSIT December 16, 1998

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J. R. Holdsworth
(TYPED OR PRINTED NAME OF PERSON MAILING PAPER OR FEE)

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NEW APPLICATION TRANSMITTAL

Transmitted herewith for filing is the patent application of

Inventor(s): Udo Bartsch, Dr. Klaus Deuter, Alois Dorfmeister, Michael Just, Jochen Korner, Otto Krestel, Otto Rzehak, Juliane Schuster, and Michael Schweigert

For: MEASURING DEVICE WITH A MEASURING MODULE AND A CLOCK

Enclosed are:

1. The papers required for filing date under 37 C.F.R. 1.53(b):
7 Pages of specification 4 Pages of claims Pages of Preliminary
1 Page(s) of abstract 2 Sheets of drawings Amendment dated
 formal
X informal
2. Declaration or Oath
X Enclosed
X Original executed by:
X Inventor(s).
 Legal representative of inventor(s) 37 C.F.R. 1.42 or 1.43.
 Joint inventor or person showing a proprietary interest on
behalf of inventor who refused to sign or cannot be reached.
 this is the petition required by 37 C.F.R. 1.47 and the
statement required by 37 C.F.R. 1.47 is also attached.
 Not Enclosed
 Application is made by a person authorized under 37 C.F.R.
1.41(c) on behalf of all the above named inventor(s). The
declaration or oath, along with the surcharge required by
37 C.F.R. 1.16(e) can be filed subsequently.
 Showing that the filing is authorized. Not required
unless called into question. 37 C.F.R. 1.41(d).
3. Language
X English
 Non-English
 A verified English translation of the following is attached:
 specification and claims
 declaration
4. Assignment
X An assignment of the invention to LRE Technology Partner GmbH
A duplicate copy of this letter is enclosed.
5. Information Disclosure Statement (IDS)
 Information Disclosure Statement with Form PTO-1449 is attached.
 Copies of IDS citations are attached.
6. Certified Copy from which Priority is Claimed
X A certified copy of Application No(s) 297 22 809.9
Filed on: December 23, 1997 Country: Germany
A certified copy of application(s) X enclosed to follow.

☒ Original
☐ Duplicate for Fee Processing

Inventor(s): Udo Bartsch, Dr. Klaus Deuter, Alois Dorfmeister, Michael Just, Jochen Korner,
Otto Krestel, Otto Rzehak, Juliane Schuster, and Michael Schweigert

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Attorney Docket No.: 3597-16

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7. Fee Calculation		Small Entity	Large Entity
Basic Fee		\$ 380.00	\$ 760.00
Total Claims:	35 - 20 = 15		270.00
(Small \$9.00; Large \$18.00)			
Independent Claims:	1 - 3 = 0		
(Small \$39.00; Large \$78.00)			
Multiple Dependent Claims	0 = 0		
(Small \$130.00; Large \$260.00)			
Total		\$	\$ 1030.00

☐ Amendment canceling extra claims enclosed.

☐ Amendment deleting multiple dependencies enclosed.

8. Small Entity Statement
☐ Verified statement claiming small entity status will follow.

9. Fee payment being made at this time
☐ Not Enclosed
☐ No filing fee is to be paid at this time. (This and the surcharge required by 37 C.F.R. 1.16(e) can be paid subsequently.)
☒ Enclosed
☒ basic filing fee \$ 1030.00
☒ recording assignment. (\$40.00; 37 C.F.R. 1.21(h)(1)) \$ 40.00
☐ petition fee for filing by other than all the inventors or person on behalf of the inventor where inventor refused to sign or cannot be reached. (\$130.00; 37 C.F.R. 1.47 and 1.17(h).) \$
☐ for processing an application with a specification in a non-English language. (\$130.00; 37 C.F.R. 1.52(d) and 1.17(k).) \$
Total Fees Enclosed \$ 1070.00

10. Method of Payment of Fees
☒ check in the amount of \$ 1070.00
☐ Charge Account No. 13-0235 in the amount of \$

11. Authorization to Charge Additional Fees
☒ The Commissioner is hereby authorized to charge the following additional fees which which may be required to Deposit Acct. No. 13-0235 [McCormick, Paulding & Huber]
☒ 37 C.F.R. 1.16 (filing fees)
☒ 37 C.F.R. 1.16 (presentation of extra claims)
☒ 37 C.F.R. 1.17 (application processing fees)

12. Instruction as to Overpayment
☒ credit Account No. 13-0235 [McCormick, Paulding & Huber]
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13. Return Receipt Postcard
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Respectfully submitted,

Date December 16, 1998

/rh

Donald K. Huber
Registration No. 18,686

Enclosures

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J. R. Holdsworth
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MEASURING DEVICE WITH A MEASURING MODULE AND A CLOCK

Field of the Invention

The invention concerns a measuring device including a measuring module with a data processing unit, a data input unit, and an indicating unit, as well as a clock.

Background of the Invention

One such measuring device is known for example from US-A 5,536,249. In the there described device a clock chip is provided in the measuring module and connected to the processor of the module. The time delivered from the clock chip can be indicated on the display screen of the measuring module. A disadvantage of this solution is that the clock cannot be used separately and also cannot be combined with another type of measuring device.

The invention has as its object the provision of a measuring device of the aforementioned kind, making possible a greater flexibility in regard to the use of the clock in combination with a measuring module.

Summary of the Invention

This object is solved in accordance with the invention in that the clock is a unit galvanically separated from the measuring module and in that the measuring device has means for non-touchingly obtaining the time data

indicated by the clock and for transmitting such data to the measuring module.

In the solution according to the invention, the clock is not only an internal clock chip but also is a stand-alone, usable, complete clock which can be used in combination with the measuring module, or instead as the case may be without such measuring module, and which as the case may be is combinable with several measuring modules for measuring different parameters.

The clock can have a type of stop-clock function in that the time indication of the clock at the beginning of a measurement can selectively be set to a pre-given null point, and after the ending of the measurement, is resetable to the actual time.

The clock can have an analog time indicator with hands, wherewith the means for obtaining the time obtains the positions of the hands. Such an obtaining of the hand positions can, for example, be accomplished by use of a suitable optical means, such as a photo sensor assembly for detecting emitted or reflected light or a sensor working with the ambient light.

In the measuring device of the invention a clock with an LCD screen or with a digital indicator can also be used, wherein the LCD screen is selectably switchable to dark and the measuring module has a counter triggerable by a sensor sensing the LCD screen.

In another embodiment of the invention the means for obtaining and transmitting the time data includes a device for wirelessly transmitting the data and having at least one transmitter in the clock and at least one receiver in the measuring module. Such a transmission link can work with optical signals, radio signals or infrared signals. Also, an ultrasonic transmission link can be used for the data transmission.

In a preferred embodiment the measuring module is releasably connected with the clock so that the measuring module need be connected with the clock only as needed. Such a connection can be achieved in a simple way in that the measuring module is clippable onto the clock. Such a solution is especially advantageous if under different conditions different

measurements with the different measuring modules are to be carried out or if the measuring module is needed only from time to time.

If on the other hand a measuring module is permanently needed, as for example is the case for blood sugar measurements for diabetic persons, it can be advantageous if the clock and the measuring module are arranged together in a common housing. In all events the measuring device can be so formed that it can be carried on a wrist by means of an arm band which is arranged either on the clock or on the common housing for the clock and measuring module.

The measuring module can be made for different functions. For example, the measuring module can be made for the measurement of parameters of the human body such as for the measurement of blood sugar, of the LH-value, of estrogen concentration, of the heart frequency, of the pulse beat and the blood pressure, of the body temperature, and of the skin moisture. Likewise the measuring module can be made for the carrying out of a peak flow measurement for asthma patients or for recording a short EKG sequence. Other values obtainable with such a measuring module are, for example, environmental parameters such as air pressure, the ambient temperature, the UV radiation, the geographic altitude or the contamination of the air by bacteria, poisons, and gases. Also, several of the previously-mentioned measuring functions can be joined into one measuring module.

In a further embodiment of the invention the data processing unit of the measuring module has a memory accessible through the data input unit, thereby there can be stored in the measuring module, for example, a PIN number, a check card number or other important data for the user. It is also possible to so program the data processing unit that it interrogates the memory at pre-determined intervals and, for example, enables an alarm unit to produce an alarm signal if the user is to be reminded of the taking of certain medicines or of the need to give attention to the lapsing of certain periods of time. In connection with this the data processing unit can also be connected with a speech module.

In order to increase the utility of the inventive measuring device the measuring module, that is the data processing unit and the data input unit, can be formed to carry out calculation functions so that the measuring device of the invention can also be used as a pocket calculator.

The measuring module can also be formed for the carrying out of supervisory functions, such as for example, for the control of watch people in which case the inventive measuring device can be replaced by a plug-in clock; or for legitimizing the user for different purposes.

According to a further embodiment, the measuring module has a radio receiver in order, for example, to be able to receive specific alarm signals. This receiver can also be used for determining the geographical position of the carrier of the measuring device.

According to a preferred embodiment of the invention, the measuring module is formed to indicate the amount and the application time point of a medicine so that the measuring device can be used not only for analysis but also for the purpose of therapy.

Further features and advantages of the invention will be apparent from the dependent claims and from the following description which in connection with the accompanying drawings explain the invention by way of exemplary embodiments.

Brief Description of the Drawings

The drawings are:

Fig. 1 a schematic block diagram of a measuring device according to the invention.

Fig. 2 a schematic perspective view of an arm band clock with a clip-on measuring module.

Fig. 3 a sectional view through a second embodiment of the invention, in which the measuring module and the clock are arranged in a common housing.

Fig. 4 a schematic section through a third embodiment of the invention.

Fig. 5 a schematic section through a fourth embodiment of the invention.

Detailed Description of the Preferred Embodiments

Fig. 1 shows the essential elements of a measuring device according to the invention and having a measuring module indicated generally at 10 and a clock indicated generally at 12. The measuring module contains a processor 14, serving as a data processing device, which is connected with a memory 16, a data input unit 16, and an indicator unit 20. Moreover the processor 14 is connected with an alarm 22 and a receiving chip 24. The receiving chip 24 can be formed to receive different signals. As the case may be, the receiver 24 can also be combined with an associated transmitter.

Finally, the processor 14 is connected with a measuring unit 26, which is formed to suit the existing measuring purpose, in order for example, to obtain the above-described parameters of a human body or of the environment.

The clock 12 is a customary clock, for example a digital clock, with its own clock works and the therewith associated time indicator. In the illustrated embodiment, the clock 12 is coupleable with the processor 14 of the measuring module 10 over an optical coupler 28,30. The transmission link can thereby be so formed that on one hand the time data from the clock 12 can be transmitted to the processor 14, and on the other hand, control data can also be transmitted from the processor to the clock, in order for example, to set the clock at the beginning of a measurement to a pre-given null point and after the carrying out of the measurement to again reset the clock to the actual time.

Fig. 2 shows, in schematic way, a practical embodiment of the measuring device described by way of Fig. 1. Fig. 2 shows the clock 12 with a housing 32, an indicator 34, and at least one operating element 36. On the clock housing 32 is arranged an arm band 38. The measuring module 10 is also further so fastened to the arm band 38 that the optical couplers 28,30 of

the two units lie opposite to one another. The measuring module 10 can, for example, be formed as a measuring device for the evaluation of test strips 40.

Fig. 3 shows a schematic section through a further embodiment of the invention wherein parts which are similar to those of the embodiment of Figs. 1 and 2 have been provided with the same reference numbers.

In the embodiment illustrated in Fig. 3 the clock 12 and the measuring module are arranged in a common housing 42. The clock 12 is a clock with an analog indicator, that is a numeral dial 43 and hands 44,46 and can be operated by a crown 48 extending out of the housing 42. In the housing 42 is a window 49 through which the dial and the hands 44,46 of the clock 12 can be observed.

The measuring module includes a small plate 50 on which the processor 14 and other essential parts of the measuring module are arranged. The input unit 18 is located in one side of the housing and the indicator unit 20 is arranged on the upper face of the housing. The arm band 32 is located at the under face of the housing.

The positions of the hands 44,46 are obtained, for example, through a reflected light sensor assembly including a light source 52 and a receiver 54. The light emitted from the light source 52 is in a certain position of the hour hand 46 reflected into the receiver 54 so that at this position a certain null point can be established. Also in this solution, the clock and the measuring module are units entirely separated from one another. The light source 52 can also be omitted. Instead of it, the daylight or the ambient light can be used for the same purpose.

Fig. 4 shows a modified embodiment in which the clock 12 is arranged in a pot-shaped housing which is linked to a plate 58 connected with the measuring module 10 so that the clock housing 56 can be pivoted about the pivot axis 60 in the direction of the double arrow A in Fig. 4 relative to the measuring module 10. Between the edge of the housing 56 and the plate 58, a seal 62 is provided. As one will recognize, the pot-shaped housing 56 in its closed position of Fig. 4 covers a measuring opening 64 of the measuring module 10 into which opening 64 the test strip 40 is insertable.

On the inner side of the clock housing 56 are provided contact elements or contact pads 66 which stand in connection with the data processing unit of the measuring module 10 and through which a data transmission can take place to an external device, for example a data exchange with the external device. Such an external device can, for example, be a memory chip which is inserted into the pot-shaped housing 56 so that the contacts of the memory chip come into connection with the contact elements 66 in order to make possible such a data transfer.

Instead of the illustrated contact pads, plug contacts can also be provided for connection to an external device for a data exchange. The contact pads can also be arranged on the measuring module 10.

Fig. 5 shows a modified embodiment which largely agrees with the embodiment of Fig. 4 and in which the clock housing 56 is not linked to the plate 58, the clock housing instead carrying a ring 68 which by way of a type of bayonet connection with projections 70 is received in a groove 72 on the measuring module 10 having a corresponding control surface, so that by a rotation of the ring 68 the housing 56 is pressed against the plate 58 of the measuring module 10. The seal 62 thereby serves to provide an entirely sealed closure.

CLAIMS

1. A measuring device comprising a measuring module (10) with a data processing unit (14), a data input unit (18), and an indicator unit (20), as well as a clock (12), characterized in that the clock (12) is a unit galvanically separate from the measuring module (10) and in that the
5 measuring device has means for non-touchingly obtaining the indicated time data from the clock (12) and for transmitting said time data to the measuring module (10).
2. A measuring device according to Claim 1, further characterized in that the clock (12) has a time indicator (34) which is selectably settable to a pre-given null point and which, after the ending of a measurement, is resettable to the actual time.
3. A measuring device according to Claim 1, further characterized in that the clock (12) has an analog time indicator with hands (44,46) and that the time obtaining means (52,54) obtains the hand positions.
4. A measuring device according to Claim 3, further characterized in that the time obtaining means (52,54) is formed to optically obtain the hand positions.
5. A measuring device according to Claim 1, further characterized in that the clock has a digital indicator with an LCD screen (34), that the LCD screen (34) is selectively switchable to dark, and that the measuring module (10) has a counter which is triggerable by a sensor sensing
5 the LCD screen (34).
6. A measuring device according to Claim 5, further characterized in that the means for obtaining and for transmitting the time data includes a device (28,30) for wirelessly transmitting by way of at least one transmitter in the clock (12) and/or at least one receiver in the measuring
5 module (10).
7. A measuring device according to Claim 1, further characterized in that the measuring module (10) is releasably connected with the clock (12).

8. A measuring device according to Claim 7, further characterized in that the measuring module (10) is clippable onto the clock (12).

9. A measuring device according to Claim 1, further characterized in that the clock (12) and the measuring module (10) are arranged in a common housing.

10. A measuring device according to Claim 1, further characterized in that it is provided with an arm band (38) to allow the device to be carried on a wrist.

11. A measuring device according to Claim 1, further characterized in that the measuring module (10) is formed for the measurement of parameters of the human body.

12. A measuring device according to Claim 1, further characterized in that the measuring module (10) is formed for the measurement of environmental parameters.

13. A measuring device according to Claim 1, further characterized in that the data processing unit (14) has a memory (16) accessible through the data input unit (18).

14. A measuring device according to Claim 1, further characterized in that it has an alarm device (22) coupled with the measuring module (10).

15. A measuring device according to Claim 1, further characterized in that the measuring module (10) is formed for the carrying out of calculation functions.

16. A measuring device according to Claim 1, further characterized in that the measuring module (10) is formed for the carrying out of supervisory functions.

17. A measuring device according to Claim 1, further characterized in that the measuring module (10) is formed to indicate the amount and the application time point of a medicine.

18. A measuring device according to Claim 1, further characterized in that the measuring module (10) has a radio receiver (24).

19. A measuring device according to Claim 1, further characterized in that the measuring module (10) is formed for the determination of a geographic position.

20. A measuring device according to Claim 1, further characterized in that the data processing unit (14) is connected with a speech module.

21. A measuring device according to Claim 1, further characterized in that it has at least one contact surface (66) for data exchange with an external device.

22. A measuring device according to Claim 21, further characterized in that the contact surface (66) is covered.

23. A measuring device according to Claim 1, further characterized in that the clock (12) has a housing (56) which covers the measuring module (10).

24. A measuring device according to Claim 23, further characterized in that on the side of the clock housing (56) facing the measuring module (10) are arranged contact elements (66) connected with the data processing unit (14) of the measuring module (10) for connection with data transmission means.

25. A measuring device according to Claim 14, further characterized in that the device has at least one contact surface (66) for data exchange with an external device, and in that the data processing unit (24) is so coupled with the alarm device (22) that the alarm device is actuated when a data exchange is ended.

26. A measuring device according to Claim 1, further characterized in that it includes a transponder for the contactless transmission of data.

27. A measuring device according to Claim 23, further characterized in that the clock housing (56) is pot-shaped and receives the measuring module (10).

28. A measuring device according to Claim 27, further characterized in that the clock housing (56) is pivotally linked to the measuring module (10) about an axis (60).

29. A measuring device according to Claim 27, further characterized in that between the clock housing (56) and the measuring module (10,58) is arranged a seal (62).

30. A measuring device according to Claim 27, further characterized in that a surrounding ring (68) is arranged on the clock housing (56), which ring has a bayonet type connection with a control surface (72) formed on the measuring module (10) that it can be received by the measuring module so that a seal (62) between the clock housing (56) and the measuring module (10,58) is compressed.

31. A measuring device according to Claim 1, further characterized in that the clock (12) has a dial having a holographic pattern printed on at least a part of the dial.

32. A measuring device according to Claim 1, further characterized in that the measuring module contains a compass.

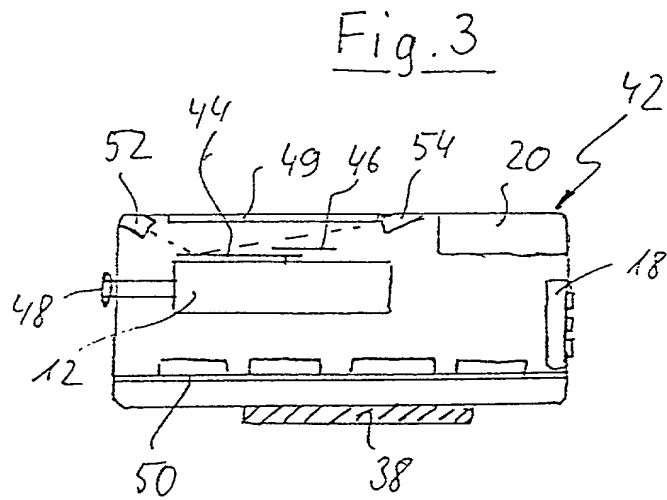
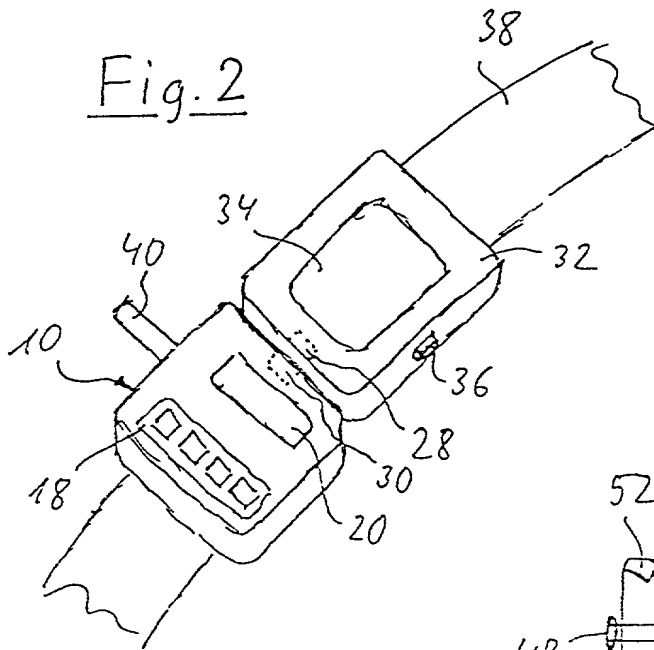
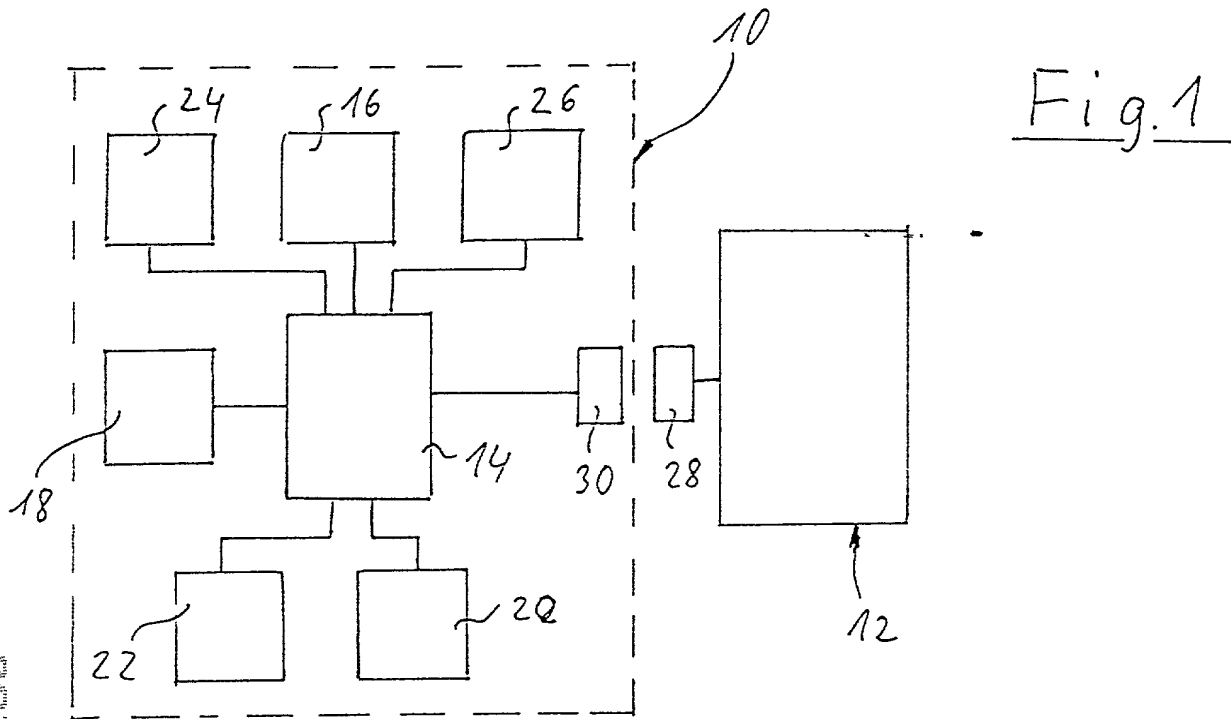
33. A measuring device according to Claim 21, further characterized in that the clock (12) has a stop clock function.

34. A measuring device according to Claim 1, further characterized in that it is formed for the carrying out of electronic cash functions.

35. A measuring device according to Claim 1, further characterized that it contains an altimeter.

ABSTRACT OF THE DISCLOSURE

A device for the measurement of human body parameters and/or environmental parameters, or for measuring periods of time is made up of a clock and a measuring module with the measuring module including a data processing unit, a data input unit, and an indicator unit. The measuring module can be releasably connectable with the clock to allow the clock to be used either by itself or in combination with the measuring module. When the measuring module and the clock are used in combination, the time indications provided by the clock are obtainable by the measuring module and can be used for various purposes depending on the functions to be carried out by the measuring module. The measuring module can also have contacts for connection with an external device to allow exchange of data between the measuring module and the external device.



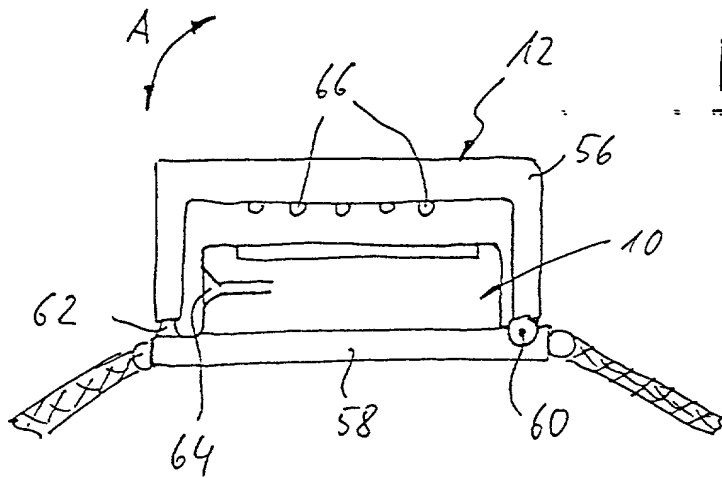


Fig. 4

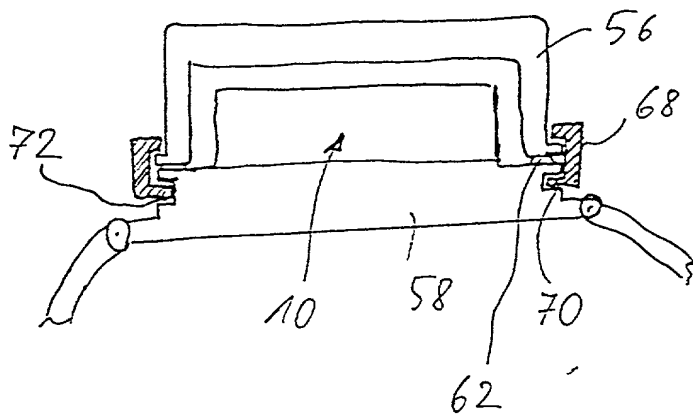


Fig. 5

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

MEASURING DEVICE WITH A MEASURING MODULE AND A CLOCK

the specification of which

(Check ☒ is attached hereto.

one) _____ was filed on _____ as Application
Serial No. _____ and was amended
on _____
(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the U.S. Patent and Trademark Office all information known to be material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, §§1.56 and 1.63(d).

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Priority
Claimed
X _____
Yes No

297 22 809.9 Germany 23 / 12 / 97
(Number) (Country) (Day/Month/Year Filed)

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States Provisional Application(s) listed below:

Priority
Claimed

Yes No

(Number) (Filing Date)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §§1.56 and 1.63(d) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)

(Filing Date)

(Status: patented,
pending, abandoned)

I hereby appoint Donald K. Huber, Registration No. 18,686; Theodore R. Paulding, Registration No. 19,294; John C. Hilton, Registration No. 22,965; Frederick J. Haesche, Registration No. 24,529; John C. Linderman, Registration No. 24,420; J. Kevin Grogan, Registration No. 31,961; Richard R. Michaud, Registration No. 40,088; Daniel G. Mackas, Registration No. 38,541; Peter J. Rainville, Registration No. 41,263; Marina F. Cunningham, Registration No. 38,419; and Lawrence Cruz, Registration No. 36,385; all of the firm of McCormick, Paulding & Huber LLP, CityPlace II, 185 Asylum Street, Hartford, Connecticut 06103-4102, telephone (860) 549-5290, as my attorneys to prosecute this application, to make alterations and amendments therein, to receive the patent and all correspondence relating to this application, and to transact all business in the U. S. Patent and Trademark Office connected therewith, and the said attorneys are hereby given full power of substitution and revocation.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Full name of sixth joint
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C. H. H.

Inventor's Signature

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Date	Citizenship

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Residence Address

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Post Office Address

Table 1

Year	Population	GDP	Per capita GDP	Life expectancy	Infant mortality rate	Fertility rate	Urban population	Rural population
1980	76,000,000	10,000,000,000	130	65	100	5.0	20,000,000	56,000,000
1985	90,000,000	15,000,000,000	160	68	80	4.5	25,000,000	65,000,000
1990	105,000,000	20,000,000,000	190	70	60	4.0	30,000,000	75,000,000
1995	120,000,000	25,000,000,000	210	72	50	3.5	35,000,000	85,000,000
2000	130,000,000	30,000,000,000	230	74	40	3.0	40,000,000	90,000,000
2005	140,000,000	35,000,000,000	250	76	30	2.5	45,000,000	95,000,000
2010	150,000,000	40,000,000,000	270	78	20	2.0	50,000,000	100,000,000
2015	160,000,000	45,000,000,000	280	80	15	1.5	55,000,000	105,000,000
2020	170,000,000	50,000,000,000	290	82	10	1.0	60,000,000	110,000,000

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Otto Rzehak
Full name of seventh joint
inventor, if any

O. Rzehak
Inventor's Signature

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Date Citizenship

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Full name of ninth joint
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